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12 **BEFORE THE**
13 **CALIFORNIA STATE WATER RESOURCES CONTROL BOARD**

14 **HEARING IN THE MATTER OF CALIFORNIA**
15 **DEPARTMENT OF WATER RESOURCES**
16 **AND UNITED STATES BUREAU OF**
17 **RECLAMATION REQUEST FOR A CHANGE**
18 **IN POINT OF DIVERSION FOR CALIFORNIA**
19 **WATER FIX**

20 **TESTIMONY OF GWENDOLYN**
21 **BUCHHOLZ**

22 I, Gwendolyn Buchholz, do hereby declare:

23 **I. INTRODUCTION**

24 My name is Gwendolyn Buchholz and I am employed as a Vice President with
25 CH2M HILL, Inc. I received a Bachelor's of Arts in Physics from California State University,
26 Sacramento; and a Master's of Science in Civil Engineering from University of California,
27 Davis. I am a Registered Civil Engineer in California. I have over 41 years of experience
28 and have been employed at CH2M HILL since 1997. Since 2008, CH2M HILL has served
as a subconsultant to ICF International and HDR, Inc. to prepare documents supporting the
Bay Delta Conservation Plan/California WaterFix (CWF). During that period, I have served
as the management lead for CH2M HILL staff to assist the California Department of Water
Resources (DWR) and Department of the Interior, Bureau of Reclamation (Reclamation), to
conduct water-related impact analyses, including the water supply, surface water, and
groundwater chapters and portions of the water quality chapter for the CWF Environmental
Impact Report (EIR)/Environmental Impact Statement (EIS). I also served as the Principal-

1 in-Charge to assist Reclamation in preparing the 2016 Biological Assessment for CWF
2 (BA), with ICF International as the primary subconsultant. Exhibit DWR-32 is a true and
3 correct copy of my Statement of Qualifications.

4 **II. OVERVIEW OF TESTIMONY**

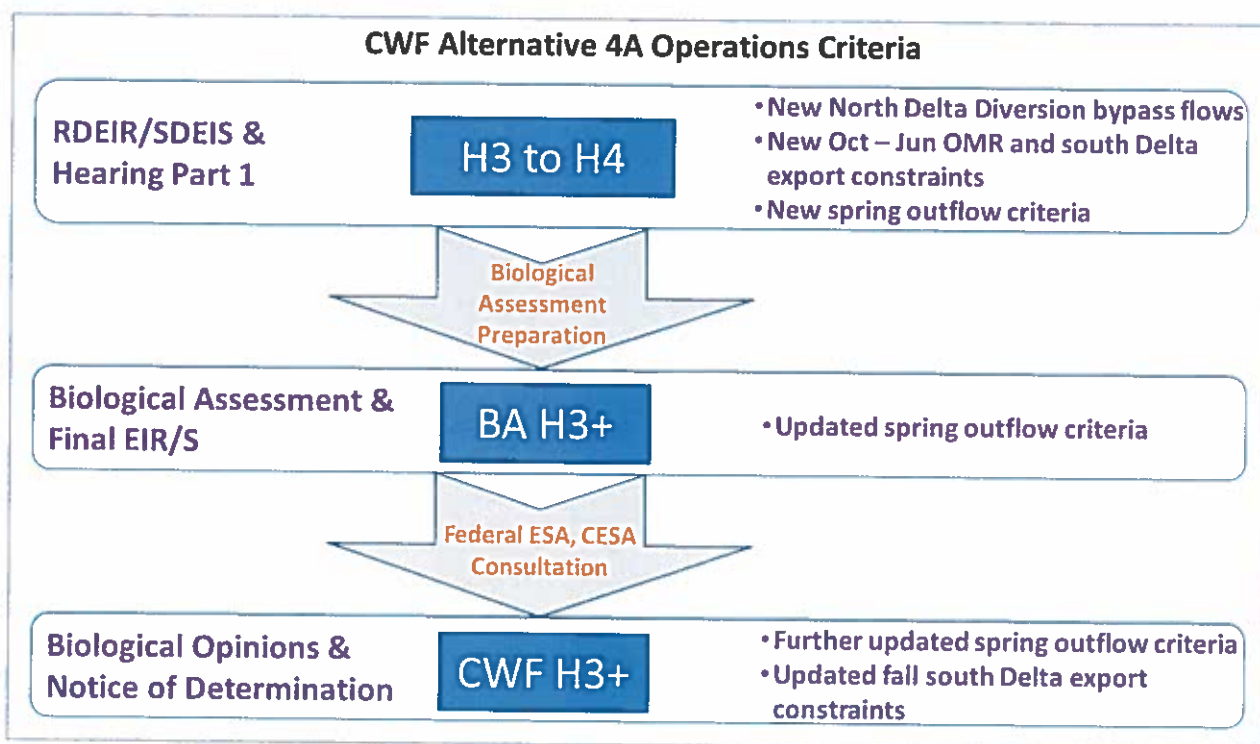
5 My testimony summarizes the Adopted Project, CWF Alternative 4A with operational
6 scenario H3+ (CWF H3+) as detailed in the July 2017 Certified Final Environmental Impact
7 Report (2017 Certified FEIR), Findings of Fact and Statement of Overriding Considerations,
8 Mitigation Monitoring and Reporting Program, and Notice of Determination (NOD).
9 (collectively, Exhibits SWRCB-102, SWRCB-108, SWRCB-109, SWRCB-110, SWRCB-
10 111, and SWRCB-112.) This testimony overviews the facilities, environmental
11 commitments, and operations criteria for CWF H3+; improvements to Delta outflow criteria
12 by implementing CWF H3+; public benefits from implementing CWF H3+; and an overview
13 of DWR and Reclamation testimony that will address the key issues for Part 2.

14 **III. PROJECT SUMMARY**

15 CWF H3+ is the Project adopted by DWR that is the subject of the Petition for
16 Change in Point of Diversion requested by DWR and Reclamation. CWF H3+ was
17 approved by DWR through filing of the NOD with the Governor's Office of Planning and
18 Research, State Clearinghouse, on July 21, 2017. (Exhibit SWRCB-112.)

19 CWF H3+ includes facilities described in the BA (Exhibit SWRCB-104) and 2016
20 Bay Delta Conservation Plan/California WaterFix Final Environmental Impact
21 Report/Environmental Impact Statement (2016 FEIR/S). (Exhibit SWRCB 102.) CWF H3+
22 includes operational criteria and environmental commitments presented in the 2017
23 Certified FEIR, including requirements from the U.S. Fish and Wildlife Service (USFWS)
24 and National Marine Fisheries Service (NMFS) Biological Opinions for CWF H3+, as
25 summarized in Figure 1. (collectively, Exhibits SWRCB-102, SWRCB-108, SWRCB-105,
26 and SWRCB-106.) Additional criteria were imposed by the California Department of Fish
27 and Wildlife (CDFW) in the Incidental Take Permit (ITP). (Exhibit SWRCB-107.)
28

Figure 1



A. REFINEMENT OF THE PROJECT DESCRIPTION

CWF H3+ facilities and operations are the results reached through refinements based upon technical information and comments compiled during EIR/EIS development. The initial proposed project was presented in the BDCP as Alternative 4, which included three new intakes in the north Delta and two tunnels to convey diverted water to the existing export facilities in the South Delta.

After considering additional technical information and public comment compiled following publication of the 2013 Draft BDCP EIR/EIS, DWR and Reclamation published the July 2015 Partially Recirculated Draft EIR/Supplemental Draft EIS (RDEIR/SDEIS). (Exhibit SWRCB-3.) As presented in Part 1, the RDEIR/SDEIS identified Alternative 4A as the preferred alternative with operational scenarios within the range defined by H3 and H4. (See Exhibits DWR-1 and DWR-5; Exhibit SWRCB-4.) The RDEIR/SDEIS included refinements to Alternative 4 facilities and operations, which were included within Alternative 4A. (Exhibit SWRCB-3.) Alternative 4A facilities were revised to relocate pumping plant

1 equipment from the new intakes to a new forebay near the existing Clifton Court Forebay,
2 relocate conveyance facilities to reduce impacts on private property, and focus habitat
3 restoration on mitigation of impacts of CWF facilities and operations. (Exhibits DWR-51
4 and DWR-57.) Alternative 4A was refined by including changes to spring Delta outflow
5 criteria. As described in the RDEIR/SDEIS, the specific operations would be determined
6 through the EIR/EIS and permitting processes, including issuance of the USFWS and
7 NMFS biological opinions and adaptive management program. Therefore, the preferred
8 alternative operations in the RDEIR/SDEIS were presented as a range between
9 Alternatives 4A H3 and Alternative 4A H4, as shown in blue box within the top component
10 of Figure 1.

11 Additional technical information and responses to many public and agency
12 comments on the RDEIR/SDEIS were used to further refine the project description, defined
13 as Alternative 4A H3+, in the BA published in August 2016 and the 2016 FEIR/S published
14 in December 2016. The refined project description included modifications to the spring
15 Delta outflow criteria as described in chapter 3 of the BA and in the 2017 Certified EIR, and
16 shown in the middle component of Figure 1. (Exhibits SWRCB-104, SWRCB-102 and
17 SWRCB-108.)

18 Alternative 4A H3+ was further refined during consultation with USFWS and NMFS
19 during preparation of the biological opinions, as described in Appendix A2 of the NMFS
20 Biological Opinion and Section 6 of the USFWS Biological Opinion. (Exhibits SWRCB-105,
21 pp. 11-15 and SWRCB-106, Appendix A2.) Both biological opinions (BOs) included
22 reasonable and prudent measures, which are non-discretionary measures imposed through
23 the BOs that are necessary or appropriate to minimize the impacts as determined under the
24 federal Endangered Species Act. (Exhibits SWRCB-105, Sections 10.3 and 10.4, and
25 SWRCB-106, Sections 2.9.3 and 2.9.4, pp. 1176-1203.) The refined Alternative 4A H3+
26 were presented in the 2017 Certified FEIR and NOD published in July 2017, as shown in
27 the bottom component of Figure 1. (Exhibits SWRCB-102, SWRCB-108, SWRCB-109,
28 SWRCB-110, SWRCB-111, and SWRCB-112.)

1 Following publication of the 2017 Certified FEIR and BOs, additional criteria were
2 imposed by CDFW in the ITP, as shown in Figure 1. (Exhibit SWRCB-107.)

3 **B. CWF H3+ PROJECT FACILITIES**

4 CWF H3+ involves constructing three new north Delta intake structures with state-of-
5 the-art fish screens that, when coupled with dual conveyance, will increase water supply
6 reliability, and align water operations to better reflect natural seasonal flow patterns. CWF
7 H3+ reduces the ongoing reliance on existing diversion facilities located in the south Delta,
8 allows for greater operational flexibility to protect fish, and diverts water during high flow
9 events relative to drier periods. Water will be diverted from the Sacramento River through
10 three fish-screened intakes on the east bank of the Sacramento River between Clarksburg
11 and Courtland. Water will travel from the fish-screened intakes through a tunnel system to
12 pumping plants at the modified Clifton Court Forebay with continued conveyance to the
13 existing Banks and Jones Pumping Plants. CWF H3+ includes the continued use of the
14 south Delta export facilities. This CWF H3+ facilities description is consistent with the
15 facilities described in Part 1 of the State Water Board hearing. (See Exhibits DWR-2,
16 DWR-51, and DWR-57, and Exhibit SWRCB-102.) Additional information will be further
17 described in testimony by engineering and recreation expert, Mr. Bednarski. (See Exhibit
18 DWR-1022.)

19 **C. CWF H3+ ENVIRONMENTAL COMMITMENTS**

20 CWF H3+ includes habitat restoration commensurate with mitigation requirements
21 described in the 2017 Certified FEIR. (Exhibits SWRCB-108, Table 3-9, p. 200, and
22 SWRCB-111, Table 5-1, p. 5-1.) The environmental commitments in the 2017 Certified
23 FEIR are based on the commitments presented in the RDEIR/SDEIS, and 2016 FEIR/S;
24 and refined based on consultation with the USFWS, NMFS, and CDFW. (Exhibit SWRCB-
25 108.) The refinements presented in the 2017 Certified FEIR include an additional 1,533
26 acres of delta smelt tidal natural community's habitat for a total of 1,828 acres
27 (Environmental Commitment 4), 20 acres of riparian natural community habitat for a total of
28 271 acres (Environmental Commitment 7), and 1,022 acres of grassland natural community

1 habitat for a total of 2,092 acres (Environmental Commitment 8) as compared to the 2016
2 FEIR/S. (Exhibit SWRCB-108.)

3 Environmental commitments that address habitat restoration, protection,
4 enhancement, and management activities to mitigate for adverse effects from
5 implementation of the proposed water conveyance facilities are summarized in Table 3-9 of
6 the of the 2017 Certified FEIR, as presented below.

7
8 **Environmental Commitments for CWF H3+ (Table 3-9, Exhibit SWRCB-108)**

9 **Environmental Commitment 3: Natural Communities Protection and Restoration**

| | |
|--|--------------------|
| 10 Valley/Foothill Riparian | 103 acres |
| 11 Grassland | 1,060 acres |
| 12 Vernal Pool Complex and Alkali Seasonal Wetland | 188 acres |
| 13 Complex | |
| 14 Nontidal Marsh | 119 acres |
| 15 Cultivated Lands | 11,870 acres |
| 16 Total: | Up to 13,340 acres |

17 **Environmental Commitment 4: Tidal Natural** Up to 1,828 acres
18 **Communities Restoration**

19 **Environmental Commitment 6: Channel Margin** Up to 4.6 levee miles
20 **Enhancement**

21 **Environmental Commitment 7: Riparian Natural** Up to 271 acres
22 **Community Restoration**

23 **Environmental Commitment 8: Grassland Natural** Up to 2,092 acres
24 **Community**

25 **Environmental Commitment 9: Vernal Pool and Alkali** Up to 48 acres
26 **Seasonal Wetland Complex Restoration**

27 **Environmental Commitment 10: Nontidal Marsh** Up to 832 acres
28 **Restoration**

Environmental Commitment 11: Natural Communities At sites protected or
Enhancement and Management restored under
Environmental
Commitments 3–10

Environmental Commitment 12: Methylmercury At sites restored
Management under Environmental

Environmental Commitments for CWF H3+ (Table 3-9, Exhibit SWRCB-108)

| Commitment 4 | |
|--|---|
| Environmental Commitment 15: Localized Reduction of Predatory Fishes | At north Delta intakes and at Clifton Court Forebay |
| Environmental Commitment 16: Nonphysical Fish Barrier | At Georgiana Slough |

Additional environmental protection conditions were imposed by CDFW in the ITP. (Exhibit SWRCB-107.)

This is a summary of the proposed environmental commitments. Details and effects from the environmental commitments will be discussed in the testimony of biological resources experts. (See Exhibits DWR-1012, DWR-1013 and DWR-1014.)

D. CWF H3+ OPERATIONAL CRITERIA

CWF H3+ includes some operational criteria presented in the BA and 2016 FEIR/S for Alternative 4A H3+, as discussed in Part 1 of the State Water Board hearing; and refinements based upon the BOs, including:

- Implementation of the North Delta Diversions Intake Bypass Flows with real-time operations approach
- Refined south Delta export criteria for October and November with real-time operations approach
- Refined operations criteria for the Head of Old River Gate with real-time operations approach
- For spring Delta outflow:
 - Added Delta outflow targets in March;
 - Eliminated Delta outflow criteria in April and May when total Delta outflow exceeds 44,500 cubic feet per second; and
 - Reduced Delta exports in March through May to achieve Delta outflow targets.
- Refined the minimum flow standard in the Sacramento River at Rio Vista to be

1 consistent with D-1641

2 Real-time operations decision-making process will manage operations with respect
3 to flow and water quality monitoring, and aquatic species protection within the parameters
4 set by the regulatory requirements, operational criteria, and SWP and CVP operations.
5 Operations are informed by several interagency coordination groups, as described in the
6 testimony of Mr. Miller (Exhibit DWR-1011) and listed within 2017 Certified FEIR Table 3-
7 35. (Exhibit SWRCB-102, p. 3-277.)

8 Operational criteria and real-time operations will be discussed in more detail in
9 testimony by the SWP and CVP operations experts, and by the CalSim II and DSM2
10 experts.

11 **E. ADAPTIVE MANAGEMENT**

12 Adaptive management addresses potential long-term changes in operations due to
13 new scientific knowledge. For CWF H3+, the broad purposes of adaptive management are
14 to: (a) promote collaborative science, (b) guide the development and implementation of
15 scientific investigations and monitoring, and (c) apply new information and insights to
16 management decisions and actions, and recommend changes to CWF H3+. (See Exhibits
17 SWRCB-108, p. 189, and SWRCB-111.)

18 As part of the adaptive management process, DWR, Reclamation, CDFW, USFWS,
19 NMFS, and other appropriate agencies will coordinate with collaborative science
20 workgroups to identify and prioritize potential changes to address uncertainties related to
21 the effects of SWP and CVP operations, including CWF, and other actions intended to
22 minimize or mitigate effects to protected species. (Exhibits SWRCB-108 and SWRCB-
23 106.) Adaptive management will be discussed in more detail in testimony by the biological
24 experts.

25 **F. REAFFIRMATION OF RANGE OF ALTERNATIVES**

26 As described above in Section A, Refinement of Project Description, CWF H3+ is
27 within the range of alternatives described in Part 1 of the State Water Board hearing. At
28 the time of the Part 1 hearing, the CWF H3+ BOs had not been issued; therefore, DWR and

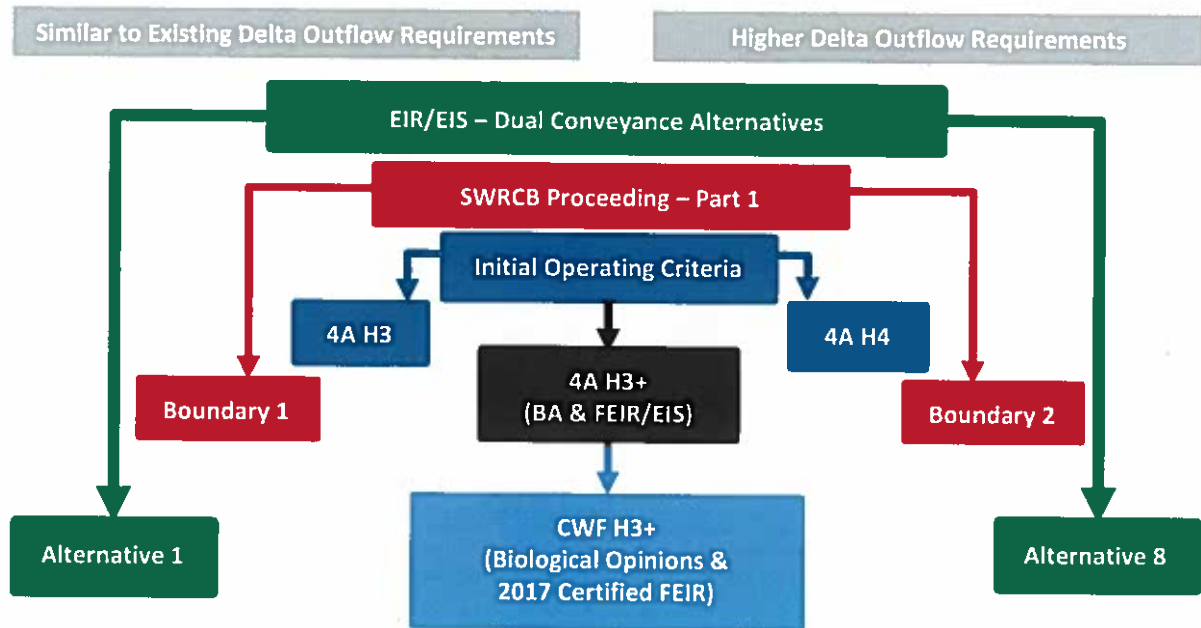
1 Reclamation presented an operational range defined by H3 and H4 to assess potential
2 impacts at issue in Part 1. (Exhibit DWR-51.)

3 A boundary analysis was presented in the Part 1 hearing, defined by Boundary 1
4 and Boundary 2, to provide a broad range of operational criteria anticipated to occur within
5 the adaptive management process. (Exhibit DWR-114.)

6 Now, at the beginning of Part 2 of the State Water Board hearing, the criteria of the
7 BOs have been defined and DWR has adopted a project, as discussed above; therefore,
8 the Project Description presented in this testimony is now more narrowly focused on CWF
9 H3+. Boundary 1 and Boundary 2, are not further discussed in the Part 2 hearing. H3 and
10 H4 are discussed to a limited extent as reference points for the analysis of CWF H3+. This
11 is shown in Figure 2.

12 Due to adaptive management, the CWF H3+ operations could be refined in the
13 future. However, the modified operations would only be an outcome of the adaptive
14 management process if the many agencies participating in that process determined that the
15 changes would be protective of fish and wildlife; and any outcome is anticipated to be
16 within the range of alternatives analyzed in the EIR/EIS and within Boundary 1 and
17 Boundary 2, as presented in Part 1 of the State Water Board hearings.

Figure 2 Range of Alternatives



IV. IMPROVED DELTA FLOW CRITERIA

CWF H3+ will comply with the Delta outflow criteria established by D-1641, 1995 State Water Board San Francisco Bay/Sacramento–San Joaquin Delta Estuary Water Quality Control Plan (WQCP) (Exhibit SWRCB-27) and the 2008 USFWS (Exhibit SWRCB-87) and 2009 NMFS biological opinions (Exhibit SWRCB-84). (Exhibit SWRCB-102.) This hearing is also considering what constitutes "appropriate Delta flow criteria" as described in the Delta Reform Act. (California WaterFix Hearing – Ruling Regarding Scheduling of Part 2 and Other Procedural Matters, August 31, 2017, page 12.)

CWF H3+ provides increased spring Delta outflow criteria as compared to Existing Conditions and the No Action Alternative. (Exhibits SWRCB-102 and SWRCB-108.) Increased Delta outflow provided by CWF H3+ benefits aquatic resources consistent with the USFWS and NMFS BOs and the Delta Reform Act. It is anticipated that conditions related to Delta outflow would also be considered as part of adaptive management under CWF H3+.

V. PUBLIC INTEREST

The Delta is a vitally important ecosystem that supports hundreds of aquatic and

1 terrestrial species, many of which are listed by the federal and state governments as
2 threatened or endangered. (SWRCB-102, Sections ES.1.1; 1.2, p. 1-4; and Appendix 1A.)
3 The Delta watershed captures runoff from approximately 40 percent of the land in
4 California, and is critical hub of two of the state's most important water systems, SWP and
5 CVP, which serve over 25 million of Californians and 4 million acres of agricultural land
6 uses, including water users in the Bay Area, San Joaquin Valley, Central Coast, and
7 southern California. (Id.) The agricultural, municipal, and industrial land uses supported by
8 water conveyed through the Delta are the source of much of California's financial stability
9 and prosperity. (Id.)

10 The current SWP and CVP water delivery systems in the Delta are increasingly
11 affected by regulatory constraints on water project operations, especially related to the
12 presence of listed fish species near the south Delta export pump intakes at certain times of
13 year. (Exhibit SWRCB-102, Appendix 1A and Chapter 2.) These conditions limit the timing
14 and amount of water that can be exported through the south Delta pumps for the SWP and
15 CVP. Continued decline of the Delta's ecosystem has led to increased restrictions on SWP
16 and CVP water supply operations which has reduced deliveries to water users. Therefore,
17 CWF H3+ has been selected to improve California's water supply reliability and contribute
18 to the restoration of the Delta's fragile ecosystem. (Exhibit SWRCB-112.)

19 CWF H3+ will modernize, and add flexibility to the state's water system by aligning
20 water operations to reflect natural seasonal flow patterns due to the creation of new water
21 diversions in the north Delta equipped with state-of-the-art fish screens and reduced
22 reliance on south Delta exports. CWF H3+ will capture additional flow during wetter
23 periods when unregulated flows are available. CWF H3+ will increase average annual
24 deliveries of water conveyed through the Delta as compared to the No Action Alternative
25 over the long-term, and especially in wetter water years. (See Exhibits SWRCB-102 and
26 DWR-1016.)

27 Through the extensive environmental commitments, CWF H3+ will contribute to
28 reversing the trend of habitat loss, habitat degradation, declining populations of native

1 species, and degradation of natural flow patterns caused by reverse flows through the
2 Delta. (See SWRCB-108, Table 3-9, p. 200.) CWF H3+ will reduce water exports in drier
3 years when Delta aquatic resources are subject to increased stresses; and increase Delta
4 exports in wetter years when aquatic resources are not as affected by stresses in the Delta.
5 This type of operation will reduce reverse flows in the south Delta, and provide river flows
6 for native fish species to enhance survival of listed species including delta smelt, longfin
7 smelt, and Chinook salmon. CWF H3+ will reduce reverse flows in Old and Middle Rivers
8 in all months except April, during which reverse flows will remain similar to Existing
9 Conditions. (Exhibits SWRCB-102, Section 6.0, p. 6-1 and SWRCB-108, p. 14.) Overall,
10 CWF H3+ will result in reduced entrainment of aquatic species, such as Delta Smelt and
11 Longfin Smelt, at the south Delta intakes. (Exhibit DWR-1012.) The new water diversions
12 in the north Delta will be equipped with state-of-the-art fish screens to minimize and avoid
13 effects to migrating fish species. (Exhibits DWR-1012 and DWR-1022.) The CWF H3+
14 adaptive management process will address scientific uncertainties regarding benefits and
15 impacts on Delta aquatic species. (Exhibit DWR-1014.) Monitoring and improving
16 operations will provide benefits and/or minimize negative effects to aquatic species.
17 (Exhibits DWR-1012 and DWR-1013.)

18 CWF H3+ will also provide protections and benefits to California's economy.
19 California cities that receive water from the Delta (including areas within the Bay Area,
20 Central Coast, and southern California) support populations of more than 25 million and the
21 associated economies. A functioning water delivery system that can provide more reliable
22 supplies within regulatory limits and withstand the impacts of climate change and
23 earthquakes is critical to continuation of the economic conditions. (Exhibits SWRCB-102
24 and SWRCB-108.)

25 Without implementation of CWF H3+, the negative economic impact of water export
26 cutbacks could occur statewide. If Delta water exports are further restricted due to
27 continued decline of protected species and due to the inflexibilities caused by operational
28 limitations of existing facilities, local water agencies would probably increase reliance on

1 potentially overdrawn sources, including local surface water storage and groundwater.
2 (Exhibit SWRCB-102.) CWF H3+ will support more stable agricultural activities by enabling
3 land use implementation and reducing risk associated with uncertain water deliveries.
4 (Exhibit SWRCB-102.)

5 Construction of CWF H3+ will create more than 8,600 new construction jobs, and will
6 generate revenue in a range of other sectors of the local economy and other regions of
7 California. (Exhibit SWRCB-102, Section 16.3.3.9, pp. 16-160 – 16-185.)

8 Overall, implementation of CWF H3+ will improve water supply, ecosystem
9 conditions, and economics of the state of California; and contribute to the public interest of
10 the citizens and environment of California.

11 **VI. OVERVIEW OF REMAINING TESTIMONY FOR DWR AND RECLAMATION**

12 Additional testimony will be presented to the State Water Board by DWR and
13 Reclamation as part of the Part 2 hearing, including:

- 14 • Analysis of operations under CWF H3+, including a discussion of real-time
15 operational criteria. This will be included in the Panel 1 testimony.
- 16 • Discussion of the modeling approaches and conditions under CWF H3+ related to
17 hydrologic, water quality, and biological models, including a discussion of the
18 adaptive management approach. This will be included in the Panel 2 testimony.
- 19 • Discussion of engineering-related construction based impacts of CWF H3+,
20 including impacts to navigation. This will be included in the Panel 2 testimony.
- 21 • Discussion of potential impacts to recreation due to implementation of CWF H3+.
22 This will be included in the Panel 3 testimony.

23
24 Executed on this 28th day of November 2017 in Sacramento, California.

25
26 
27 (Gwendolyn Buchholz)
28